8-28-2014

Impulsivity traits as determinants for smoking behavior

Stacey Munyon

IMPULSIVITY TRAITS AS DETERMINANTS FOR SMOKING BEHAVIOR

by
Stacey Munyon

A Thesis

Submitted to the
Department of Psychology
College of Science and Mathematics
In partial fulfillment of the requirement
For the degree of
Masters of Arts in School Psychology
at
Rowan University
May 6, 2014

Thesis Chair: Roberta Dihoff, Ph.D.

Abstract

Stacey Munyon
IMPULSIVITY TRAITS AS DETERMINANTS FOR SMOKING BEHAVIOR
2013/14
Roberta Dihoff, Ph.D.
Master of Arts in School Psychology

The notion that smoking is in direct relation to the character trait of impulsivity is widely agreed upon. This study examines the individual character traits of the UPPS-P impulsivity scale that comprise the construct of impulsivity as they relate to cigarette smoking. This study seeks to illustrate whether or not there is determination of smoking behavior as a result of high levels of one or more of these impulsive traits. Analysis will be evaluated through means of several different analyses of variance to determine if any relationships are present.

Table of Contents

Abstract	iii
List of Figures	vi
List of Tables	vii
Chapter 1: Introduction	1
Chapter 2: Literature Review	3
Smoking Behavior and Statistics	3
Potential Factors of Smoking	4
Smoking and Genetics	7
Smoking and Personality	9
Smoking and Mood	10
Impulsivity and Smoking	12
UPPS-P Impulsivity Scale	14
Validation of UPPS-P	16
Purpose	17
Chapter 3: Methodology	18
Participants	18
Materials	18
Design	19
Procedure	21
Chapter 4: Results	22
Descriptive Analyses	22

Table of Contents (Continued)

Negative Urgency	22
Lack of Premeditation	23
Lack of Perseverance	24
Sensation Seeking	26
Positive Urgency	27
Total Scores	28
Chapter 5: Discussion	31
Analysis of Character Traits and Total Scores	31
Implications	32
Limitations	33
Future Research	34
References	35

List of Figures

Figure		Page
Figure 1	Means for smokers and non-smokers across all character traits	30

List of Tables

Table	Page
Table 1 Descriptive Statistics for Negative Urgency	23
Table 2 One-Way Analysis of Variance for Negative Urgency	23
Table 3 Descriptive Statistics for Lack of Premeditation	24
Table 4 One-Way Analysis of Variance for Lack of Premeditation	24
Table 5 Descriptive Statistics for Lack of Perseverance	25
Table 6 One-way Analysis of Variance for Lack of Perseverance	25
Table 7 Descriptive Statistics for Sensation Seeking	26
Table 8 One-Way Analysis of Variance for Sensation Seeking	27
Table 9 Descriptive Statistics for Positive Urgency	27
Table 10 One-Way Analysis of Variance for Positive Urgency	28
Table 11 Descriptive Statistics for Overall Scores	28
Table 12 One-Way Analysis of Variance for Total Scores	29

Chapter 1

Introduction

The physiological differences between smokers and non-smokers have been a topic for research in the past. Malouff, Thorsteinsson, and Schutte (2006) studied personality in relation to smoking, linking certain aspects of the Five-Factor Scale of Personality to smokers. The personality traits that smokers exhibited higher levels of include low conscientiousness, low agreeableness, and high neuroticism. Extraversion and openness are also included in the Five-Factor Model but were not found to be correlated with smoking in the study mentioned above. The present study uses the UPPS-P scale of impulsivity, which examines five different character traits that lead to impulsive behavior: negative urgency, positive urgency, lack of premeditation, lack of perseverance, and sensation seeking. This test does not measure impulsivity as a single trait, but rather measures these five individual components that lead to impulsivity individually. Past studies have yet to take a look at these factors as determinants for smoking behavior.

Depue and Collins (1999) suggest that impulsivity is a heterogeneous category that includes several different traits. The current study sought to find a relationship between smoking and one or more of the five constructs in the UPPS-P scale said to make up impulsive personality. It was hypothesized that the individual character traits that contribute to the impulsivity ratings outlined in the UPPS-P scale are potential determinants of the behavior of smoking, and that smokers will score higher in one or more trait overall than non-smokers. It was also hypothesized that smokers will score

higher overall on the impulsivity scale than non-smokers using the UPPS-P scale of impulsivity.

The UPPS-P Scale of Impulsivity is a 59 item self-report scale, revised version of the original UPPS created by Whiteside and Lynam (2001). It helps to identify five key individual personality constructs in adults or adolescents that previously were lumped together under the term impulsivity (Cyders, et al., 2007). Its subscales include:

a. Negative Urgency: Refers to the tendency to experience strong impulses under conditions of negative affect.

b. Positive Urgency: Refers to the tendency toward rash action in response to positive mood.

c. (Lack of) Premeditation - The tendency to fail to think and reflect on the consequences of an act before engaging in that act.

d. (Lack of) Perseverance - Difficulties remaining focused on a task that may be long, boring, or difficult.

e. Sensation seeking - Sensation seeking encompasses two aspects: (1) the tendency to enjoy and pursue exciting activities and (2) an openness to trying new experiences that may or may not be dangerous.

This study makes the assumptions that people will honestly disclose whether they smoke or not, and subjects will have the capacity to understand and answer the questions on the self-report scale to the best of their abilities.

Few researchers have studied impulsivity and smoking behavior together (Doran, et al., 2012). This study seeks to examine this relationship further and draw conclusions about determination of smoking behavior. The next chapter will provide an extensive literature review to highlight the past research, current research, and a more in depth look at the need for this type of research.

Chapter 2

Literature Review

Review of past literature provides a necessary foundation for new research regarding impulsivity and cigarette smoking behavior. Smoking and impulsivity will be defined, as well as reviewed extensively in regards to past research surrounding each separately, and collectively. Although past research has linked impulsivity and smoking in the past, this study examines the relationship using the UPPS-P impulsivity scale (International Society for Research on Impulsivity) in relation to smoking behavior.

Smoking Behavior and Statistics

The Centers for Disease Control and Prevention MMWR, 2011, maintained that smoking cigarettes is the single largest preventable cause of morbidity and mortality in the United States. The Center for Disease Control and Prevention conducted a study between the years 2005 and 2010 on adults at or above the age of 18 in the United States to determine if smoking prevalence has decreased in that period of 5 years. National Health Interview Surveys (NHIS) and Behavioral Risk Factor Surveillance system surveys were implemented among U.S. adults to compose the sample size. Current cigarette smokers were defined as individuals who have smoked 100 or more cigarettes in their lifetime, and reported that they, at the time of the survey, still smoked everyday or almost every day. They found that there was an overall decrease, although not consistent year-to-year, in cigarette smoking in adults. They also reported that the health consequences of smoking include heart disease, cancer of many forms, pulmonary disease and issues, adverse reproductive effects, and exacerbation of current chronic health issues in adults. Every year, smoking causes 443,000 deaths, $96 billion in

medical expenses related to smoking, and $97 billion in lost productivity (Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report, 2008).

The Center for Disease Control and Prevention (CDC) reported the statistics surrounding smoking and tobacco use in adults over the age of 18 in the United States in 2010. It was reported that 43.8 million people, or 19% of the population in the United States smoked cigarettes (Center for Disease Control and Prevention, 2013). Cigarette smoking tends to be more common in men than women, 21.6% and 16.5% respectively. By age, 18.9% of adults aged 18-24 were smokers, 22.1% between 25-44, 21.4% between 45-64, and 7.9% during the ages of 65 and older. By race or ethnicity, 31.5% of smokers were American Indians/Alaskan Natives, 9.9% were Asian, 19.4% were black, 12.9% were Hispanic, and 20.6% were white. By education level, only 5% of smoking adults held a postgraduate college degree, 9.3% had an undergraduate degree, 23.8% had a high school diploma, 34.6% had 9-11 years of school, and 45.3% had a GED diploma. By poverty status, 20% of adults below the poverty level were smokers, while 17.9% were above it. Poverty thresholds were based on data published by the U.S. Census Bureau (Centers for Disease Control and Prevention, 2013). These numbers have all decreased slightly from the percentages in 2005, as reported in the Morbidity and Mortality Weekly Report, or MMWR (Morbidity and Mortality Weekly report, 2011).

Potential Factors of Smoking

Research looking at smoking links all types of factors to the behavior. Factors ranging from personality (Malouff, Thorsteinsson, & Schutte, 2006), genetics (Erblich, Lerman, Self, Diaz, & Bovbjerg, 2004), and impulsivity (Doran, Khoddam, Sanders, Schweizer, Trim, & Myers, 2013) are linked to smoking.

In 2000, B. Flay, J. Petratitis, and F.Hu searched for influences contributing to tobacco and alcohol usage. The study showed that both biological and non-biological influences played a role in the smoking behavior. The non-biological factors that were discussed in relation to the behavior were a) the influence of parental modeling of the smoking behavior, b) developmental influences, and developing a desire for alcohol I adolescence, and c) cultural influences, particularly advertising that made smoking seem appealing (Flay et al., 2000). The study focuses primarily on experimental tobacco usage (ETU) among adolescents. The study concentrates on the factors of smoking that have roots in broad environmental or cultural factors. They acknowledge that the smoking behavior is not caused by one factor in particular, but can be generally a corroboration of media depictions, social factors, poor relationships and esteem issues, and personal factors. From this study a theoretical framework was derived, known as the theory of triadic influence (TTI). According to TTI, the cultural environment (including the media, politics, and societal factors) in which adolescents grow up in, in addition to their person (including biological disposition, genetic inheritance, and personality), and the situation they grow up in (involving intrapersonal relationship, family, school, and community) make up the 3 “streams” of influence that determine behaviors (Flay et al., 2000). They have provided through a detailed review of studies of causal processes in another earlier article empirical evidence underlining the theory of triadic influence. That article, written in 1995 was not published. It has been acknowledged in this, and many other works surrounding the environmental and cultural aspects of smoking behavior, that the relations between smoking behaviors and tobacco use behaviors are highly complex, and are not always limited to their triad of influences. It is stated that other risk factors can

modify these behaviors. They posed a list of recommendations for future research, including studies of causal processes involving sociocultural environmental factors, intrapersonal characteristics, and leading to dependence and addiction.

Bricker et al. (2009) acknowledges the recommendations of the previous studies by Flay et al. and addressed these needs via their study in 2009. They address the need for examining the extent to which TTI-consistent psychological factors directly influence adolescent smoking transitions, and to what extent psychological factors moderate the influence of family and friends' smoking on adolescent smoking transitions. It confirmed the use of TTI in a longitudinal study investigating 5 psychological risk factors consistent with the TTI as predictor of adolescent smoking transitions. The 5 risk factors included parent-noncompliance, friend-compliance, rebelliousness, low achievement motivation, and thrill seeking. Among 4218 participants, all 5 psychological risk factors were assessed in 9th graders, and two social factors were assessed in 3rd and 9th graders (parents' and close friends'). The sample was taken from a large randomized control group, used in a Washington State school-based tobacco use prevention trial, the Hutchinson Smoking Prevention Project (HSPP). The study makes sure that at least one parent/guardian was a smoker when the participant was in 3rd grade, the participant's psychological factors, smoking status, and close friend's smoking status' in the 9th grade and the participant's smoking status in the 12th grade. Parental smoking reports are taken via survey over the phone or by mail. They concluded that each of these as being major predictors of adolescent smoking transitions. While this study highlights very important factors that contribute, no doubt, to the behavior of smoking, it does not extend past the 5

psychological risk factors outlined to include other factors that surely can play a role in this behavior.

Smoking and Genetics

The role of genetics has been implicated as a key component in adults smoking behavior. Madden, et al. (1999) published *The Genetics of Smoking Persistence in Men and Women: A Multicultural Study.* The study drew from sets of European twins in 3 different countries to determine the extent to which the same environmental factors and genetic factors are responsible for smoking initiation, and continuation among family members, specifically twins. They found that familial influences on risk for persistence couldn't be entirely explained by the same factors responsible for risk of initiation of smoking. Evidence for substantial risk for smoking persistence was high among twins. The study proposed that the high costs in healthcare surrounding smoking is a reason to put gene-mapping as a high priority for future research.

Madden et al. (1999) was conducted with primarily European descendent participants. Other twin studies support genetic influence as a factor for initiation and maintenance of smoking (Distel et al., 2012; Kendler & Sullivan, 1999; Lessov-Schlaggar et al., 2013; and McCaffery, Lloyd-Ricardson, Niaura, Papandonatos, & Stanton, 2008). There is preliminary evidence suggesting that there is a gene that may influence smoking initiation and nicotine dependence (Lerman et al., 1999).

While genetic factors found here may be substantial to a portion of the population, particularly twins, there individuals who may not have smokers in their families that may not carry the gene; but smoke nonetheless.

Further research into the genetics of smoking has provided empirical evidence that there are, in fact, genetic factors in some people that contribute to cigarette cravings and smoking behavior (Hutchinson, LaChance, Niaura, & Smolen, 2002). This research has found a link between the DRD4 VNTR polymorphism related to dopamine, cravings, and arousal to higher rates of smoking cravings when introduced to smoking cues. 68 participants (32% women, 68% men) between the ages of 18 and 50 were included in the study. The participants were 88% Caucasian and 11% other ethnicities. Although the research has pointed to a pivotal change in the way we look at cravings of cigarettes, the sample size, ethnic majority, and male:female ratio were all limitations of the study. The study also poses the notion that while it found a strong association between polymorphism and craving, there was no measure of nicotine dependence (Hutchinson, et al.).

More research into these polymorphisms has included things such as risks of cigarette smoking in African Americans and Caucasians\alcoholism (Sander, Harms, Dufeu, Kuhn, Rommelspacher, & Schmidt, 1997), and stress-induced cigarette cravings (Erblich, Lerman, Self, Diaz, & Bovbjerg, 2004; and Erblich, Bovbjerg, & Diaz, 2011). One study examines both cue- and stress-related smoking cravings together in relation to genetic polymorphisms (Erblich et al., 2011). They set out to find out whether the same polymorphisms predict both cue- and stress- related cravings. They used a valid and tested measure of smoking, the Fagerstrom Test of Nicotine Dependence (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991) in their study. The results supported their hypothesis: "…cue and stress-induced cigarette craving were predicted by different polymorphisms, such that variants in the glycine and dopamine pathways were predictive

of cue-induced craving, whereas variants in the stress-corticotrophin pathway predicted stress-induced craving" (Erblich et al, 2011, p. 40).

Smoking and Personality

The Five-Factor Personality model and its sub-scales, linked to the behavior of smoking (Malouff, Thorsteinsson, & Schutte, 2006), is an organized hierarchy of personality that is broken down into: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (McCrae & John, 1992). Its reliability lies within theoretically based personality questionnaires, allowing it to be consistent across observers and cultures (1992). The validity of the observer ratings has been tested and proved, and is concluded to have a higher validity in predicting overall performance than previously believed (Oh, Wang, & Mount, 2010).

Some of the facets that constitute the five-factor model are linked to smoking behavior (Terracciano & Costa, 2004; and Malouff et al. 2006). In 2004, the relationship between smoking and personality was examined using the five-factor model as a frame of reference for the construct of personality (Terracciano & Costa). What was found was consistent with a study examining the same relationship two years later; that three of the five factors that comprise the five-factor model are associated with smoking behavior. These three traits include low-conscientiousness, low agreeableness, and high levels of neuroticism (Terracciano & Costa, 2004; and Malouff et al, 2006). Malouff, et al in 2006 determined that exhibiting these three factors alone or altogether point to increased likelihood of smoking behavior. In 2002, it was also found that neuroticism was a very key factor in smoking (Goodwin & Hamilton). It was determined through a study examining interactions between personality and personal environment factors to

determine if these play a role in smoking development that high levels of extraversion was a factor, which was not found to be the case in the studies mentioned previous (deLeeuw, Scholte, Sargent, Vermulst, & Engels, 2010). deLeeuw et al did, however, find that low levels of agreeableness was a factor, as found by Malouff et al. It is stated through Gilbert's Situation-Trait Adaptive Response model of smoking that situations, such as stressors and smoking cues, in addition to negative emotions and a lack of persistence, cause smoking behavior.

It is found that large amounts of people with personality disorders are also nicotine dependent (Donals, Chartrand, & Bolton, 2013; Harrington, Robinson, Bolton, Sareen, & Bolton, 2011; Solty, Crockford, White, & Currie, 2009; and Zvolensky, Jenkins, Johnson, & Goodwin, 2011). The association between these two constructs can vary depending on which personality disorder is displayed. Co-morbidity with anxiety and depression might explain this relationship, especially in certain personality disorders, including dependent, schizoid, avoidant, histrionic, and paranoid (Zvolensky, 2011). A study of 188-64 year old adults in England concluded similar information, finding a correlation between borderline and schizotypal traits (Kolliakou & Joseph, 2000). All of these studies provide overwhelming evidence for personality-based factors being the cause of smoking behavior.

Smoking and Mood

Depression and smoking behavior are consistently reported to be co-morbid in clinical and community-based practices (Dierker, Avenevoli, Stolar, & Merikangas, 2002; Khaled, 2013; and Richards, Cohen, Morrell, Watson, & Low, 2013). Findings suggest as rates of anxiety and depression diagnoses go up, smoking synonymously goes

up as well. Smoking cessation attempts are often lower with people who have depression, and with smoking being the number one killer in the U.S., it is important to look at this, and other correlates closer (2013). 72% of patients studied in a 5-year prospective study of patients with major depressive disorder were regular or intermittent smokers (Holma, Holma, Melartin, Ketokiyi, & Isometsa, 2013). Smoking is also strongly associated with substance abuse of all kinds (Holma et al; and Hruska, Bernier, Kenner, Kenner, Boros, Richarson, & Delahanty, 2014).

In 2009, it was hypothesized that higher depression rates in mid-adolescents would predict smoking behavior as adolescents (Audrain-McGovern, Rodriguez, & Kassel). It was found that this hypothesis was correct, in fact, higher depression symptoms co-morbid with smoking led to increased peer smoking behavior as well (Audrain-McGovern et al, 2009; and Mercken, Steglich, Sinclair, Holliday, & Moore, 2012).

Smoking behavior in depressed individuals is due to a variety of factors, including shared genetic factors, shared environmental factors, and using it as a sort of self-medication (Mendelsohn, 2012). People with depression or that have had depression in the past are 2-times as likely to be current smokers (Wilhelm, Mitchell, Slade, Brownhill, & Andrews, 2003).

Studying the emotional risk factors of smoking help us to inform prevention efforts in the future (Weinstein & Mermelstein, 2013). Negative mood variability, overall negative mood, and depression all predict escalation of future smoking behavior (Weinstein & Mermelstein).

Impulsivity and Smoking

Impulsivity is defined as any behavior that occurs with less forethought before decisions, and susceptibility towards reactions to internal or external stimuli without regard to consequences, in likeness to individuals with similar ability and knowledge (What is Impulsivity? ISRI). Impulsivity is an important construct to the field of psychology, and is directly linked to every major system of personality. Whiteside and Lynam (2000) find that impulsivity plays a prominent role in understanding psychopathology. It may be the most common diagnostic criteria utilized in the DSM-IV. Impulsivity disorders are prominent as well in the DSM, from intermittent explosive disorder and pyromania to kleptomania (2000). According to the DSM, impulsivity appears in the diagnostic criteria for personality disorders, mania, bulimia nervosa, dementia, and substance abuse and use. Smoking behavior can be linked to higher rates of impulsivity, in terms of disregard to certain health risks, financial accompaniments, and social implications. Impulsivity is measured with a variety of different scales, including the BIS11 translations, Balloon Analogue Risk Task, Cued Go No-Go, Immediate and Delayed Memory Tasks, Barratt Impulsiveness Scale, and the UPPS-P Impulsivity Scale.

Impulsivity is often implicated in drug and nicotine dependence (Bickel, Odum, & Madden, 1999). The act of smoking tells us something of human behavior: that the amount of a reinforcer to an impulsive individual is regulated by the delay in which that reinforcer is received (Logue, 1988). In other words, a reward that is to be waited for is not worth as much as an instant reward. Bickel et al. (1999) describes smoking as a

"rapid loss of subjective value for delayed outcomes" (p. 448), and states that smoking is related to the pursuit of immediate rewards.

While much research focuses on impulsivity in addition to one other construct, one study examines impulsiveness, in addition to stress, in relation to smoking tobacco (Ansell, Gu, Tuit, & Sinha, 2012). It has been shown that nicotine is involved with altering the neurobiology of a person, inevitably disposing them to future impulsive behavior (Ansell, et al., 2012). Impulsivity and stress are both risk factors for smoking. Stress has been found to cause impulsive behavior, therefore causing smoking to occur. Impulsive behavior is increased by chronic stress, trauma, and other life events (Ansell, et al.)

Researchers finds that impulsive behavior can also be defined by anything that interferes or is incompatible with our long-term goals, and that suppressing this behavior can allow us to attain those goals (Stahl et al, 2013). There are multiple components that make up the construct of impulsivity. Although these components are found to have no significance to the construct of impulsivity, the individual components including the control of stimulus interference, proactive interference, response interference, and decisional, and motivational impulsivity have been examined (Stahl, et al). One scale that reliably measures impulsivity via five character traits is the UPPS-P Impulsivity scale, which will be introduced later in the study.

One other reliable scale mentioned above is the Barratt Impulsiveness Scale-Brief. This scale is a general, non-specific self-report measure of the personality trait of impulsivity (Steinberg, Sharp, Stanford, & Tharp, 2013). It has been used in a variety of ways across studies and in relation to a number of constructs (Balevich, Flory, & Wein,

2013; Nielsen et al., 2012; and Randall, Rowe, Dong, Nock, & Colman, 2013). Due to the fact that the study limits its specificity in references to specific sub-traits, its limitations provide a necessity for more fine-tuned research.

Research shows that higher levels of impulsivity are associated with heightened expectancies for reinforcement from smoking, therefore posing a greater risk for smoking initiation (Doran et al, 2013). Also, two traits linked to impulsivity often contribute to the expectancies of this form of positive reinforcement: sensation seeking and negative urgency (Doran et al). Another study points out sensation seeking as an important correlate to the smoking behavior. (Reynolds et al, 2007). Sensation seeking behavior is a major character sub-trait in the UPPS-P Impulsivity Scale. The correlations found with this character trait lend credibility to the UPPS-P scale.

UPPS-P Impulsivity Scale

Smoking and impulse control are widely correlated. The relationship between nicotine dependence and frequency of impulse control disorders is conformed in various studies (Ansell, Gu, Sinha, & Tuit, 2012; LeJoyeux, Kerner, Thauvin, & Loi, 2006; and Reynolds, 2003). Impulsivity has also been linked to drugs, drinking, and antisocial behavior. It is concluded that impulsivity is more directly a factor in desire to quit and continuing drug use, and less directly associated with severity or duration of drug use (Moshier, Ewen. & Otto, 2013). Many of the studies relating this trait to behaviors have utilized the UPPS impulsivity scale, which is a 59-item self-report scale comprised of separate facets that formulate the construct of impulsivity.

The UPPS impulsivity scale is comprised of the traits: urgency, (lack of) perseverance, (lack of) premeditation, and sensation seeking. In 2007, Cyders et al.

added a fifth subscale (distinction between positive and negative urgency). Convergent and discriminant validity for the necessity of this distinction has been confirmed in past research. Smoking and other behaviors are sustained by individuals for different reasons (Smith et al., 2007). For one individual, the function of a behavior may be to distract from negative emotions, whereas for another it may serve to sustain positive emotions It is important to observe these disparities and acknowledge that these individuals will each respond differently to treatment. With the distinction of positive and negative urgency, discrimination between different types of ADHD can be observed (Smith et al, 2007).

Lack of premeditation refers to a difficulty in observing consequences before engaging in an act (Cyders et al., 2007). It is likely to be related to conscientiousness and disorders that involve sufficient ability to plan out actions or anticipate consequences. Disorders associated with this character trait may be related to antisocial personality disorder, dementia, and psychopathy (Whiteside & Lynam, 2001). Alternately, lack of perseveration relates to difficulties in remaining focused on a long, boring, or difficult task (Cyders, et al., 2007), and may be related to disorders that involve inability to ignore distracting stimuli or staying on task, such as ADHD (Whiteside & Lynam, 2001). Sensation seeking behavior encompasses desire to engage in risky or high-excitement activities, and an openness to try new experiences, dangerous and non-dangerous (Cyders, et al., 2007). Both high sensation seeking and lack of premeditation have been found to be prominent in individuals who have a large gap in the relationship between their intentions and their behaviors (Ewen, Moshier, & Otto, 2013). Sensation seeking is often highly correlated with substance abuse disorders (Whiteside & Lynam, 2001). Positive urgency refers to experiencing strong impulses under conditions of negative

affect, whereas negative urgency is related to acing rash in response to positive mood (Cyders, et al, 2007). Negative urgency is associated has been found to be related to cognitive distortions that can undermine thought processes, increasing likelihood of impulsive actions or behaviors. (Gagnon, Daelman, McDuff, & Kocka, 2013). In utilizing the UPPS-P for examining motivational systems accounting for variance in externalizing behaviors, negative urgency is also found to be associated with aggression (Carlson, Pritchard, & Dominelli, 2013).

Validation of UPPS-P

Studies have found that urgency is a predictor of tobacco cravings (Billieux, Van der Linden, & Ceschi, 2007). Whiteside and Lynam in 2009 have concluded that age may also be a factor in determining these traits as functions, and that adolescents that engage in these types of behaviors may exhibit higher levels of sensation seeking, while for adults it may be more so urgency.

Many studies have confirmed the validity of the UPPS scale. In 2009, German researchers Kämpfe and Mitte studied the validity of the individual traits within the UPPS scale. Some research has examined the validity of the UPPS-P scale in terms of psychopathology. It is found that women have higher positive and negative urgency, lower premeditation, and lower sensation seeking than men (Billieux et al, 2012). In examination of individual traits, negative urgency is positively associated with smoking and drinking, and lower levels of perseverance are correlated with higher depression and anxiety. Billieux et al. have supported external validity for low conscientiousness (lack of premeditation and perseverance), sensation seeking, and urgency as legitimate constructs in the determination of impulsivity. The UPPS-P scale is one measure of behaviors

shown to have a clinically useful relationship among risk taking outcomes (Cyders, 2013). In 2013, the variance across males and females was measured to ensure that validity measures are invariant across sex. Through measuring the measurement invariance of the scale across sex, the scales structural invariance across sex, and whether the 5 traits differentially relate to risk outcomes as a function of sex, they concluded that comparisons of men and women on this scale is considered valid. It appears to function comparably across both sexes (Cyders).

Purpose

A research suggests, higher impulsivity levels are associated with an increased likelihood of taking up smoking, but the individual motives for the behavior varies (Grano, Virtanen, Vahtera, Elovainio, & Kivimaki, 2004). In understanding the specific aspects of impulsivity as they relate to smoking behavior, we can learn to target those traits and mold treatment around those constructs.

Chapter 3

Methodology

Past research surrounding impulsivity has discussed impulsive control disorders (ACDs) and their relation to nicotine dependence, ACDs and their role in the manifestation of alcohol disorders, and a variety of other correlational research. There is little research focused on construct of impulsivity, with regards to what character traits it is comprised of, and if these individual traits have any correlation with smoking behavior or nicotine dependence.

Participants

The study consisted of 126 students in the undergraduate Rowan University subject pool. The survey was uploaded onto the Rowan University SONA Systems website and students willingly participated electronically. Participants were not asked their sex. The degree to which a student is a smoker was gauged with a questionnaire, as well age range. The question of whether or not he or she thought it would be difficult to quit today was asked.

Materials

The UPPS-P Impulsivity Scale was utilized along with its scoring guidelines. This study also utilizes a survey designed by the researcher to determine smoking behavior. The questionnaire asks [1] *do you consider yourself to be a smoker?* [2} *do you smoke more than a pack of cigarettes a week*? [3] *have you been smoking a pack or more cigarettes a week for more than 5 months?* [4] *do you think you would find it hard to quit today?*

The independent variable was whether or not a participant was a "smoker", and the dependent variables are the scores for each character trait. The scale for measuring smoking behavior and determining smoking or non-smoking status was a questionnaire developed by the researcher for this study. It asks five simple questions to assess whether or not a person is a "smoker". The researcher determined the parameters as well.

The questionnaire has not been tested before but serves its purpose for this study. The UPPS-P scale is a public impulsivity scale downloaded and implemented in this study. Whiteside and Lynam developed this scale in 2001. It is a 59-item self-report scale. It is a revised version of the original UPPS scale developed in 2001. It identifies five personality facets that determine impulsive behavior: negative, positive urgency, lack of premeditation, lack of perseverance, and sensation seeking (novoPsych, 2012). Convergent validity was found supporting this scale in the assessment of construct and discriminant validity between different constructs (2012) in a study that compares responses on UPPS-P scale to interview data (Smith et al, 2007). They also found the same factor structure of impulsivity traits across the two. The test results in five percentiles, which are indicative of levels of impulsivity.

Design

This study investigated whether correlations exist between the individual character traits that comprise the construct of impulsivity in the UPPS-P scale and smoking behavior. It was hypothesized that one or more of the traits would be correlated with smokers. It was also hypothesized that the overall impulsivity scores for smokers would be higher for smokers than for non-smokers.

The UPPS-P scale of impulsivity utilizes a 4-choice Likert scale: Strongly Agree, Somewhat Agree, Somewhat Disagree, and Disagree. There are 59 self-report questions measuring the individual character traits. The questions pertaining to each trait are randomly dispersed throughout the survey. Participants read the survey questions and selected the best response, without knowledge of any character traits being measured.

Each survey yielded 59 survey answers, which were scored by the researcher via a process of scoring and reverse scoring responses. Each trait's responses were totaled and the mean was taken and recorded. The 5 means and the total for each trait were used to ultimately analyze the results. When scoring for these questions, it needed to be taken into consideration that 4=1, 3=2, etc. The higher the number response, the higher the level of that character trait exists. When the means for each of the five traits are added up, the total scores for impulsivity on a whole are interpreted. The higher the total score, the higher the level of impulsivity in the individual. Certain questions pertaining to each character trait had to be reverse scored in that 1=4, 2=3, etc.

Negative urgency includes responses to statements such as: "*I often make matters worse because I act without thinking when I am upset."* (reverse scored) and "*I often get involved in things I later wish I could get out of."* (reverse scored). Lack of premeditation includes responses to statements such as: *"I tend to give up easily."* and "*I am not one of those people who blurt out things without thinking."* Lack of perseverance includes responses to statements such as: "I generally like to see things through to the end" and "Once I get going on something I hate to stop." Sensation seeking includes responses to statements such as: "I'll try anything once." (reverse scored) and "I welcome new and exciting experiences and sensations, even if they are a little frightening and

unconventional." (reverse scored). Positive urgency includes responses to statements such as: "When I am very happy, I can't seem to stop myself from doing things that can have bad consequences." (reverse scored) and "I am surprised at the things I do while in a great mood." (reverse scored).

Procedure

All procedures were approved by the Institutional review Board. It was determined that a self-report survey would be most accurate. It was also determined that online data collection would be most sufficient because participants would feel more comfortable giving honest responses, and it would be more convenient. It was initially decided that the surveys would be administered in person. The names were not needed for the study therefore the study remains anonymous. Each of the 59 items in the self-report survey were entered in the SONA website individually and the survey was approved. The smoking questionnaire questions were also asked via the online SONA database. The survey was available to participants for two months online. As mentioned above, the responses were scored utilizing scoring and reverse scoring methods. A one-way analysis of variance between subjects was used for analyzing relationships between each of the five character traits in relation to smoking. Six analyses were run total. The ANOVA's and descriptive statistics were ultimately analyzed to find relationships.

Chapter 4

Results

Descriptive Analyses

One-way analyses of variance were run for each of the five character traits individually, and a one-way analysis of variance was also ran on total overall scores. Analyses resulted in significance in 4 of the 6 categories. Impulsivity traits were significantly correlated with smokers for negative urgency, sensation seeking, and positive urgency. Results of each of the ANOVA's will be outlined for each trait. Also as hypothesized, the overall totals of the means for all participants were significantly higher for smokers.

Negative Urgency. The results for the one-way analysis of variance for negative urgency support the hypothesis that one or more of the five character traits would be significantly correlated to smokers. Table 1 shows the descriptive statistics pertaining to character trait negative urgency for smokers and non-smokers. Scores for all responses range between 1.00 and 4.00. The mean score for smokers was 2.57 (SD = .48), while the mean score for non-smokers was 2.34 (SD = .59). Higher mean scores for negative urgency for smokers than non-smokers was statistically significant.

Table 1

Descriptive statistics for character trait negative urgency

	N	Mean	Std. Deviation	Std. Error	Min.	Max.
Smoker	63	2.5702	.48076	.06057	1.58	3.83
Non-Smoker	63	2.3419	.59593	.07508	1.08	4.00
Total	126	2.4560	.55129	.04911	1.08	4.00

Note. Scale for scores is 1.00-4.00. Higher scores indicate higher levels of negative urgency.

Table 2 is the results of the ANOVA for the negative urgency scores for smokers and non-smokers. The results of this ANOVA yielded significantly higher scores for smokers than non-smokers, $F(1, 126)=5.599$, $p=.020$. This supported the hypothesis that at least one character trait would be significantly higher in smokers.

Table 2

One-way analysis of variance of negative urgency scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.641	1	1.641	5.599	.020
Within Groups	36.348	124	.293		
Total	37.989	125			

Note. Finding is significant at < .05.

Lack of premeditation. Statistical processes were run to investigate levels of (lack of) premeditation in all participants. The mean for smokers was 2.07 (SD = .42), while the mean for non-smokers was 1.96 (SD = .45). While the mean scores were higher for character trait (lack of premeditation) in smokers, results were not statistically

significant. Table 3 represents the descriptive statistics from the one-way analysis of lack of premeditation scores.

Table 3

Descriptive statistics for character trait lack of premeditation

	N	Mean	Std. Deviation	Std. Error	Min.	Max.
Smoker	63	2.0735	.42952	.05411	1.18	3.18
Non-Smoker	63	1.9667	.45502	.05733	1.09	3.00
Total	126	2.0201	.44393	.03955	1.09	3.18

Note. Scale for scores is 1.00-4.00. Higher scores indicate higher levels of (lack of) premeditation.

Table 4 shows the results of the ANOVA for the premeditation scores for smokers and non-smokers. The results for the one-way analysis of variance for (lack of) premeditation did not yield significant results, $F(1, 126)=1.836$, $p=.178$.

Table 4

One-way analysis of variance of lack of premeditation scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.359	1	.359	1.836	.178
Within Groups	24.275	124	.196		
Total	24.634	125			

Note. Finding is not significant at > .05.

Lack of perseverance. Statistical processes were run to investigate levels of (lack

of) perseverance in all participants. The mean for smokers was 2.15 (SD = .44), while the mean for non-smokers was 2.00 (SD = .47). Table 5 represents the descriptive statistics from the one-way analysis of lack of perseverance scores..

Table 5

Descriptive statistics for character trait lack of perseverance

	N	Mean	Std. Deviation	Std. Error	Min.	Max.
Smoker	63	2.1524	.44245	.05574	1.20	3.30
Non-Smoker	63	2.0079	.47086	.05932	1.00	3.40
Total	126	2.0802	.46079	.04105	1.00	3.40

Note. Scale for scores is 1.00-4.00. Higher scores indicate higher levels of (lack of) perseverance.

Table 6 shows the results of the ANOVA for the perseverance scores for smokers and non-smokers. The results for the one-way analysis of variance for (lack of) perseverance did not yield significant results, $F(1, 126)=3.149$, $p=.078$.

Table 6

One-way analysis of variance of lack of perseverance scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.657	1	.657	3.149	.078
Within Groups	25.883	124	.209		
Total	26.540	125			

Note. Finding is not significant at > .05.

Sensation seeking. The results for the one-way analysis of variance for sensation seeking, in addition to the character trait of negative urgency, supported the hypothesis that one or more of the five character traits would be significantly correlated to smokers. Table 7 represents the descriptive statistics from the one-way analysis of sensation seeking scores. The mean for smokers was 3.15 (SD = 1.22), while the mean for non-smokers was 2.69 (SD = .53). Higher mean scores for sensation seeking for smokers than non-smokers is statistically significant.

Table 7

Descriptive statistics for character trait sensation seeking

	N	Mean	Std. Deviation	Std. Error	Min.	Max.
Smoker	63	3.1510	1.22795	.15471	1.42	12.00
Non-Smoker	63	2.6925	.53401	.06728	1.58	3.67
Total	126	2.9217	.97072	.08648	1.42	12.00

Note. Scale for scores is 1.00-4.00. Higher scores indicate higher levels of sensation seeking.

Table 8 shows the results of the ANOVA for the sensation seeking scores for smokers and non-smokers. The results yielded significantly higher scores for smokers than non-smokers, $F(1, 126) = 7.384$, $p = .008$. This supported the hypothesis that at least one character trait would be significantly higher in smokers.

Table 8

One-way analysis of variance of sensation seeking scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.619	1	6.619	7.384	.008
Within Groups	111.167	124	.897		
Total	117.786	125			

Note. Finding is significant at < .05.

Positive urgency. The results for the one-way analysis of variance for positive urgency supported the hypothesis that one or more of the five character traits would be significantly correlated to smokers. Table 9 represents the descriptive statistics from the one-way analysis of sensation seeking scores. The mean for smokers was 2.48 (SD=.64), while the mean for non-smokers was 2.09 (SD=67). Higher mean scores for positive urgency for smokers than non-smokers was statistically significant.

Table 9

Descriptive statistics for character trait negative urgency

	N	Mean	Std. Deviation	Std. Error	Min.	Max.
Smoker	63	2.4881	.64364	.08109	1.00	4.00
Non-Smoker	63	2.0970	.67046	.08447	1.00	3.78
Total	126	2.2926	.68336	.06088	1.00	4.00

Note. Scale for scores is 1.00-4.00. Higher scores indicate higher levels of positive urgency.

Table 10 shows the results of the ANOVA for the positive urgency scores for smokers and non-smokers. The results of the ANOVA yielded significantly higher scores

for smokers than non-smokers, F(1, 126)=11.155, p=.001. This supported the hypothesis that at least one character trait is significantly higher in smokers.

Table 10

One-way analysis of variance of positive urgency scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.818	1	4.818	11.155	.001
Within Groups	53.555	124	.432		
Total	58.373	125			

Note. Finding is significant at < .05.

Total scores. The sums of the means for all character traits were analyzed using a one-way analysis of variance. Table 11 shows the descriptive statistics for total scores. The total mean score for smokers was 12.39 (SD = 1.77). The total mean for non-smokers was 11.12 (SD = 1.85).

Table 11

Descriptive statistics for total scores

	N	Mean	Std. Deviation	Std. Error	Min.	Max.
Smoker	63	12.3987	1.77828	.22404	7.46	17.01
Non-Smoker	63	11.1281	1.85203	.23333	6.52	15.55
Total	126	11.7634	1.91746	.17082	6.52	17.01

Note. Total scores range from 7 to 17. Higher scores indicate higher levels of impulsivity.

Table 12 shows the results of the ANOVA. The results indicated statistically higher scores overall for smokers than non-smokers, $F(1, 126)=15.429$, $p=.000$). The hypothesis that smokers would score higher overall for impulsivity scores was supported.

Table 12

One-way analysis of variance of total individual impulsivity scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	50.857	1	50.857	15.429	.000
Within Groups	408.723	124	3.296		
Total	459.580	125			

Note. Finding is significant at < .05.

Figure 1 shows the scores for negative urgency, lack of premeditation, lack of perseverance, sensation seeking, and positive urgency respectively. Although only three out of the five character traits were statistically significant, the graph showed a trend in higher scores for smokers across all traits.

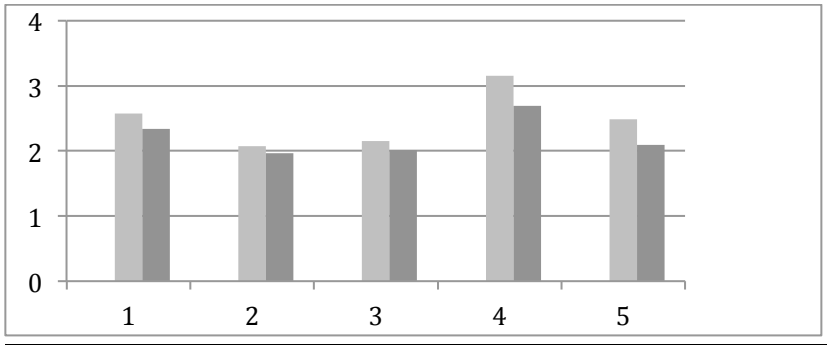

Figure 1. Means for smokers and non-smokers, across all five character traits.

Chapter 5

Discussion

The current study suggested that evidence was consistent with past research outlining the correlation between urgency and sensation seeking character traits and addictive behavior. The present findings reveal significant information regarding not only rates of impulsivity among smokers and non-smokers, but also which character traits specifically relate higher to those who do smoke cigarettes. Of the 126 participants, 50% of which were smokers, both positive and negative urgency and sensation seeking were character traits found significantly higher in individuals who smoke, supporting the theory that certain specific character traits could be factors in the personalities of those who smoke. The scores overall showed that smokers are more impulsive than are non-smokers. These findings have implications in the area of smoking cessation and areas of addictive behaviors.

Analysis of Character Traits and Total Scores

It was anticipated that the three character traits that were found to be statistically significant would in fact be more so than the two traits that were not found to be statistically significant. Lack of premeditation and lack of perseverance have not been found to determine smoking behavior. Past research has confirmed that sensation-seeking individuals are more likely to engage in impulsive, addictive behaviors such as drug and alcohol use. Urgency has also been highly correlated with addictive behaviors. Past research has not implicated the UPPS-P impulsivity scale in regards to cigarette smoking behavior, but other impulsivity scales have been used to determine associations. The results showed that although the means for all impulsivity questions were on average

higher for smokers, two of the five character traits, lack of perseverance and premeditation, showed no significance. These findings reveal that certain aspects of an individual's personality can determine risk of engaging in addictive behaviors, which can provide knowledge into the risk profile of individuals.

As hypothesized, it was also shown through a statistical analysis of variance that overall impulsivity ratings are higher among smokers than non-smokers. These results are congruent with past research that shows that impulsivity is linked to smoking and other addictive behaviors (Doran et al., 2012).

Implications

Personality profiles contribute to an individual's at-risk level for addictive behaviors. Treatment professionals can focus on specific character traits rather than the construct of impulsivity on a whole to be able to more specifically aide in the cessation of smoking behavior. This study examining individual personality characteristics in the UPPS-P scale as determinants for cigarette smoking provides empirical evidence that smokers have more impulsive personalities, specifically more urgency and sensation seeking. Smoking cessation is one of the most difficult processes involving addictive behaviors. The Centers for Disease Control and Prevention, 2014, suggests that behavioral therapies are often used in smoking cessation programs, teaching problem solving strategies and other techniques. Smoking is a behavior that can be modified with the right form of treatment. A popular behavior modification for cigarette smoking is stimulus control, which includes removing items and people that may be triggers for that behavior to occur from sight (Medscape, 2014). These types of behavior modifications could be advantageous to those individuals who score high in urgency. The likelihood of

them reaching for a cigarette when no stimuli is present is significantly decreased. Other methods to aide in smoking cessation include making a list of things to do when cravings occur. These types of interventions would be more effective if the client can understand his or her level of impulsivity and individual personality traits.

Personalities differ in that some lead people to engage in rash behavior in order to enhance positive mood, or decrease negative mood. They are functions of learned expectancies that individuals have adapted over time (Clark, 2005). Addictive behaviors such as cigarette smoking that enhance a positive mood and alleviate negative moods can be understood by studying the extent to which personality plays a part.

Limitations

The fashion in which exploratory research is conducted often leaves room for many limitations. Time constraints and allocated focus within this study are some of the factors that allowed for limitations to arise. The primary limitation to this study was the subject pool, which included only undergraduate students in South Jersey attending Rowan University, with knowledge of and access to the online database in which the study was provided. The generalizability of the results may not be highly reliable. Although there was no significance found in this population correlating a lack of perseverance or lack of premeditation to smokers, the potential that other populations may contain individuals who would score higher in these constructs is present. The survey was administered on an online database. Although the design of the study may control for such phenomena as experimenters bias and the Hawthorne effect, honesty cannot fully be measured on an online self-report questionnaire. Results did not take into account the extent to which a person is a smoker, how long a person has been smoking

for, sex, race, or age. The cross examination of one or more of these factors could have potentiated differing results, and lead to more conclusions about smoking behavior.

Future research

Research into the risk factors for smoking behavior can provide treatment professionals with means in which to prevent and treat cigarette smoking. Future research into the relationships between cigarette smoking and personality constructs should be based around other factors of an individual. Research should focus on the degree to which individuals smoke and how hard they rate their ability to quit. Gender specific differences may also be an important factor, which could be a potential focus for future research. At 126 participants, the study had a sufficient amount of data, but there is still room for a larger scale study, with participants from other populations. Taking a potential look at other socio-economic areas and populations may yield different results.

Perhaps the most interesting of potential directions for future research would lie in examination of therapies specific to these character traits and the effects they have on quitting. Whether or not therapies to quit smoking could be tailored around research of this sort is worth taking a look at. The research surrounding personality traits that determine risks of smoking could be very helpful in early intervening for at-risk individuals for addictive behaviors.

References

Ansell, E. B., Gu, P., Tuit, K., & Sinha, R. (2012). *Effects of cumulative stress and impulsivity on smoking status.* Human Psychopharmacology: Clinical And Experimental, *27*(2), 200-208. doi:10.1002/hup.1269

Audrain-McGovern, J., Rodriguez, D., & Kassel, J. D. (2009). *Adolescent smoking and depression: Evidence for self-medication and peer smoking mediation.* Addiction, *104*(10), 1743-1756. doi:10.1111/j.1360-0443.2009.02617.x

Balevich, E. C., Wein, N. D., & Flory, J. D. (2013). *Cigarette Smoking and Measures of Impulsivity in a College Sample.* Substance Abuse, *34*(3), 256-262. doi:10.1080/08897077.2012.763082

Bickel, W. K., Odum, A. L., & Madden, G. J. (1999). *Impulsivity and cigarette smoking: Delay discounting in current, never, and ex-smokers.* Psychopharmacology, *146*(4), 447-454. doi:10.1007/PL00005490

Billieux, J., Van der Linden, M., & Ceschi, G. (2007). *Which dimensions of impulsivity are related to cigarette craving?*. Addictive Behaviors, 32(6), 1189-1199. doi:10.1016/j.addbeh.2006.08.007

Billieux, J., Rochat, L., Ceschi, G., Carré, A., Offerlin-Meyer, I., Defeldre, A., & ... Van der Linden, M. (2012). *Validation of a short French version of the UPPS-P Impulsive Behavior Scale.* Comprehensive Psychiatry, 53(5), 609-615. doi:10.1016/j.comppsych.2011.09.001

Bricker, J. B., Rajan, K., Zalewski, M., Andersen, M., Ramey, M., & Peterson, A. V. (2009). *Psychological and social risk factors in adolescent smoking transitions: A population-based longitudinal study*. Health Psychology, *28*(4), 439-447. doi:10.1037/a0014568

Carlson, S. R., Pritchard, A. A., & Dominelli, R. M. (2013). *Externalizing behavior, the UPPS-P Impulsive Behavior scale and Reward and Punishment Sensitivity*. Personality And Individual Differences, *54*(2), 202-207. doi:10.1016/j.paid.2012.08.039

Centers for Disease Control and Prevention (2008). *Smoking-attributable mortality, years of potential life lost, and productivity losses---United States.* 57 (45). 1226-1228. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5745a3.htm

Centers for Disease Control and Prevention. (2011). *Current cigarette smoking among adults—United States.* Morbidity and Mortality Weekly Repor*t*. 61(44) 889–94.

Centers for Disease Control and Prevention MWWR. (2011). *Morbidity and Mortality Weekly Report: National Health Interview Survey, United States, 2005 and 2010.* 60(35). 1209.

Centers for Disease Control and Prevention. (2011). *Vital signs: Current cigarette smoking among adults aged ≥18 years --- United States, 2005—2010*. Morbidity and Mortality Weekly Report, 60(35) 1207-1212.

Centers for Disease Control and Prevention. (2013). *Adult cigarette smoking in the United States: Current estimate.* Retrieved September 2013, from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/

Clark, A. (2005). *Psychology of Moods,* Retrieved from http://books.google.com/books?id=RqNVshbRkmEC&pg=PA101&lpg=PA101&dq=positive+urgency&source=bl&ots=yknXos9F5F&sig=7MMG8YRvnSsIBg912BvxmM3U5MA&hl=en&sa=X&ei=sRNoU_M0682xBObbgvAM&ved=0CGUQ6AEwCQ#v=onepage&q=positive%20urgency&f=false

Cyders, M. A., Smith, G. T., Spillane, N. S., Fischer, S., Annus, A. M., & Peterson, C. (2007). Integration of impulsivity and positive mood to predict risky behavior: Development and validation of a measure of positive urgency. *Psychological Assessment, 19*(1), 107-118.

Cyders, M. A. (2013). *Impulsivity and the Sexes: Measurement and Structural Invariance of the UPPS-P Impulsive Behavior Scale.* Assessment, *20*(1), 86-97.

de Leeuw, R. H., Scholte, R. J., Sargent, J. D., Vermulst, A. A., & Engels, R. E. (2010). *Do interactions between personality and social-environmental factors explain smoking development in adolescence?* Journal Of Family Psychology, *24*(1), 68-77. doi:10.1037/a0018182

Dierker, L. C., Avenevoli, S., Stolar, M., & Merikangas, K. R. (2002). *Smoking and depression: An examination of mechanisms of comorbidity.* The American Journal Of Psychiatry, *159*(6), 947-953. doi:10.1176/appi.ajp.159.6.947

Distel, M. A., Trull, T. J., M. H., M., Vink, J. M., Geels, L. M., H. D., A. A., & ... Boomsma, D. I. (2012). *Borderline personality traits and substance use: Genetic factors underlie the association with smoking and ever use of cannabis, but not with high alcohol consumption.* Journal Of Personality Disorders, *26*(6), 867-879. doi:10.1521/pedi.2012.26.6.867

Donald, S., Chartrand, H., & Bolton, J. M. (2013). *The relationship between nicotine cessation and mental disorders in a nationally representative sample*. Journal Of Psychiatric Research, *47*(11), 1673-1679. doi:10.1016/j.jpsychires.2013.05.011

Doran, N., Khoddam, R., Sanders, P. E., Schweizer, C. A., Trim, R. S., & Myers, M. G. (2013). *A prospective study of the acquired preparedness model: The effects of impulsivity and expectancies on smoking initiation in college students.* Psychology of Addictive Behaviors. 27(3) 714-722. DOI: 10.1037/a0028988

Erblich, J., Lerman, C., Self, D. W., Diaz, G. A., & Bovbjerg, D. H. (2004). *Stress-induced cigarette craving: Effects of the DRD2 TaqI RFLP and SLC6A3 VNTR polymorphisms*. The Pharmacogenomics Journal*, 4,* 102–109. doi:10.1038/sj.tpj.6500227

Erblich, J., Bovbjerg, D. H., & Diaz, G. A. (2011*). Genetic predictors of cue- and stress-induced cigarette craving: An exploratory study*. Experimental And Clinical Psychopharmacology, *20*(1), 40-46. doi:10.1037/a0025369

Flay, B. R., Phil, D., Pertaitis, J. & Hu, F. B (2000). *The theory of triadic influence: preliminary evidence related to alcohol and tobacco use.* Alcohol and Tobacco. Ch. 3. http://books.google.com/books?hl=en&lr=&id=_7BpyroqxIsC&oi=fnd&pg=PA37&dq=The+theory+of+triadic+influence:+preliminary+evidence+related+to+alcohol+and+tobacco+use.&ots=jP4BoxKBR0&sig=MsZDUrd5zzoYyFXtkKw_6osNFPI#v=onepage&q=The%20theory%20of%20triadic%20influence%3A%20preliminary%20evidence%20related%20to%20alcohol%20and%20tobacco%20use.&f=false

Gagnon, J., Daelman, S., McDuff, P., & Kocka, A. (2013). *UPPS dimensions of impulsivity: Relationships with cognitive distortions and childhood maltreatment.* Journal Of Individual Differences, *34*(1), 48-55. doi:10.1027/1614-0001/a000099

Gilbert, D. G. (1995). *Smoking: Individual differences, psychopathology, and emotion.* Washington, DC: Taylor & Francis

Goodwin, R., & Hamilton, S. P. (2002). *Cigarette smoking and panic: The role of neuroticism*. The American Journal Of Psychiatry, *159*(7), 1208-1213. doi:10.1176

Granö, N., Virtanen, M., Vahtera, J., Elovainio, M., & Kivimäki, M. (2004*). Impulsivity as a predictor of smoking and alcohol consumption.* Personality And Individual Differences, *37*(8), 1693-1700. doi:10.1016/j.paid.2004.03.004

Harms, H., Dufeu, P., Kuhn, S., Rommelspacher, H., & Schmidt, L. G. (1997). *Dopamine D4 receptor exon III alleles and variation of novelty seeking in alcoholics.* American Journal of Medical Genetics*, 74*, 483–487.

Harrington, M., Robinson, J., Bolton, S., Sareen, J., & Bolton, J. M. (2011). *A longitudinal study of risk factors for incident drug use in adults: Findings from a representative sample of the US population.* Canadian Journal Of Psychiatry, *56*(11), 686-695.

Heatherton, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerstrom, K. O. (1991). *The Fagerstrom Test for nicotine dependence: A revision of the Fagerstrom Tolerance Questionnaire.* British Journal of Addiction*, 86,* 1119–1127

Holma, I. K., Holma, K., Melartin, T. K., Ketokivi, M., & Isometsä, E. T. (2013). *Depression and smoking: A 5-year prospective study of patients with major depressive disorder.* Depression And Anxiety, *30*(6), 580-588.

Hruska, B., Bernier, J., Kenner, F., Kenne, D., Boros, A., Richardson, C., & Delahanty, D. (2014). *Examining the relationships between posttraumatic stress disorder symptoms, positive smoking outcome expectancies, and cigarette smoking in people with substance use disorders: A multiple mediator model.* Addictive Behaviors, *39*(1), 273-281.

Hutchison, K. E., LaChance, H., Niaura, R., Bryan, A., & Smolen, A. (2002). *The DRD4 VNTR polymorphism influences reactivity to smoking cues*. Journal of Abnormal Psychology, *111,* 134–143.

Kämpfe, N., & Mitte, K. (2009). *A German validation of the UPPS impulsive behavior scale: Further evidence for a four-dimensional model of impulsivity*. European Journal Of Psychological Assessment, *25*(4), 252-259. doi:10.1027/1015-5759.25.4.252

Khaled, S. M. (2013). *The association between cigarette smoking and major depression in the Canadian population: A longitudinal investigation of competing non-causal and causal models.* Dissertation Abstracts International, *73*.

Kolliakou, A., & Joseph, S. (2000). *Further evidence that tobacco smoking correlates with schizotypal and borderline personality traits*. Personality And Individual Differences, *29*(1), 191-194. doi:10.1016/S0191-8869(99)00173-7

Lejoyeux, M., Kerner, L., Thauvin, I., & Loi, S. (2006). *Study of impulse control disorders among women presenting nicotine dependence.* International Journal of Psychiatry in clinical practice. 10(4): 241-246. DOI: 10.1080/1365150060065000

Lessov-Schlaggar, C. N., Lepore, R. L., Kristjansson, S. D., Schlaggar, B. L., Barnes, K., Petersen, S. E., & ... Barch, D. M. (2013). *Functional neuroimaging study in identical twin pairs discordant for regular cigarette smoking.* Addiction Biology, *18*(1), 98-108. doi:10.1111/j.1369-1600.2012.00435.x

Logue AW (1988) *Research on self-control: an integrating frame- work.* Behav Brain Sci 11:665–709

Madden, P. A. F., Heath, A. C., Pederson, N. L., Kaprio, J., Koskenvuo, M. J., & Martin, N. G. (1999). *The genetics of smoking persistence in men and women: A multicultural study.* Behavior Genetics. *29(6).* 423-431. http://ehis.ebscohost.com.ezproxy.rowan.edu/ehost/detail?vid=7&sid=dc85dc9c-d4a3-4476-99bf-b67ded7b3501%40sessionmgr10&hid=102&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=psyh&AN=2000-08440-004

Malouff, J. M., Thorsteinsson, E. B., & Schutte, N. S. (2006). *The five-factor model of personality and smoking: A meta-analysis.* J. Drug Education, 36(1) 47-58.

Medscape. (2014). *Methods to facilitate smoking cessation: Guidelines and treatment modalities*. Retrieved from http://www.medscape.org/viewarticle/418531

Mendelsohn, C. (2012). *Australian Family Physician.* Smoking and depression. 41(5). 304-307. http://www.colinmendelsohn.com.au/files/9713/5393/1221/Mendelsohn_C._Smoking_and_depression._A_review._AFP_2012415_304-307.pdf

Mercken, L., Steglich, C., Sinclair, P., Holliday, J., & Moore, L. (2012). *A longitudinal social network analysis of peer influence, peer selection, and smoking behavior among adolescents in British schools.* Health Psychology, 31(4), 450-459. doi:10.1037/a0026876

McCaffery, J. M., Papandonatos, G. D., Stanton, C., Lloyd-Richardson, E. E., & Niaura, R. (2008). *Depressive symptoms and cigarette smoking in twins from the National Longitudinal Study of Adolescent Health.* Health Psychology, *27*(3, Suppl), S207-S215.

McCrae, R. R., & John, O. P. (1992). *An introduction to the five-factor model and its applications*. Journal Of Personality, 60(2), 175-215. doi:10.1111/j.1467-6494.1992.tb00970.x

Moshier, S. J., Ewen, M., & Otto, M. W. (2013). *Impulsivity as a moderator of the intention–behavior relationship for illicit drug use in patients undergoing treatment.* Addictive Behaviors, *38*(3), 1651-1655. doi:10.1016/j.addbeh.2012.09.008

Nielsen, D. A., Ho, A., Bahl, A., Varma, P., Kellogg, S., Borg, L., & Kreek, M. (2012). *Former heroin addicts with or without a history of cocaine dependence are more impulsive than controls.* Drug & Alcohol Dependence, *124*(1/2), 113-120. doi:10.1016/j.drugalcdep.2011.12.022

novoPsych Pty Ltd. (2012) *UPPS-P Impulsive Behavior Scale (UPPS-P).* https://novopsych.com/pdfs/information/UPPS-P%20Impulsive%20Behavior%20Scale%20(UPPS-P)%20iPad%20Information.pdf

Oh, I., Wang, G., & Mount, M. K. (2011). *Validity of observer ratings of the five-factor model of personality traits: A meta-analysis*. Journal Of Applied Psychology, *96*(4), 762-773. doi:10.1037/a0021832

Randall, J. R., Rowe, B. H., Dong, K. A., Nock, M. K., & Colman, I. (2013). *Assessment of self-harm risk using implicit thoughts*. Psychological Assessment, *25*(3), 714-721. doi:10.1037/a0032391

Reynolds, B. (2003). *Impulsivity and friends who smoke as predictors of adolescent smoking.* Dissertation Abstracts International. *63*.

Reynolds, B., Patak, M., Shroff, P., Penfold, R. B., Melanko, S., & Duhig, A. M. (2007). *Laboratory and self-report assessments of impulsive behavior in adolescent daily smokers and nonsmokers.* Experimental And Clinical Psychopharmacology, *15*(3), 264-271. doi:10.1037/1064-1297.15.3.264

Richards, C., Cohen, L. M., Morrell, H. R., Watson, N. L., & Low, B. E. (2013). *Treating Depressed and Anxious Smokers in Smoking Cessation Programs.* Journal Of Consulting And Clinical Psychology, *81*(2), 263-273.

Sander, T., Lerman, C., Caporaso, N. E., Audrain, J., Main, D., Bowman, E. D., Lockshin, B., & ... Shields, P. G. (1999). *Evidence suggesting the role of specific genetic factors in cigarette smoking.* Health Psychology, *18*(1), 14-20. doi:10.1037/0278-6133.18.1.14

Shields, P. G., Lerman, C., Audrain, J., Bowman, E. D., Main, D., Boyd, N. R., & Caporaso, N. E. (1998). *Dopamine D4 receptors and the risk of cigarette smoking in African Americans and Caucasians.* Cancer Epi- demiology, Biomarkers, & Prevention*, 7,* 453–458.

Solty, H., Crockford, D., White, W. D., & Currie, S. (2009). *Cigarette Smoking, Nicotine Dependence, and Motivation for Smoking Cessation in Psychiatric Inpatients. (English).* Canadian Journal Of Psychiatry, *54*(1), 36-45.

Stahl, C., Voss, A., Schmitz, F., Nuszbaum, M., Tüscher, O., Lieb, K., & Klauer, K. C. (2013, August 19). *Behavioral Components of Impulsivity. Journal of Experimental Psychology: General. Advance online publication*. doi: 10.1037/a0033981

Steinberg, L., Sharp, C., Stanford, M. S., & Tharp, A. (2013). *New tricks for an old measure: The development of the Barratt Impulsiveness Scale–Brief (BIS-Brief).* Psychological Assessment, *25*(1), 216-226. doi:10.1037/a0030550

Sullivan, P. F., & Kendler, K. S. (1999). *The genetic epidemiology of smoking.* Society for Research on Nicotine and Tobacco*,* 1(2). S51-S57. DOI: 10.1080/14622299050011811

Terracciano, A., & Costa, P. T., Jr. (2004). *Smoking and the Five-Factor Model of personality.* Addiction, 99, 472-481.

Tomko, R. L., Solhan, M. B., Carpenter, R. W., Brown, W. C., Jahng, S., Wood, P. K., & Trull, T. J. (2013, November 25). *Measuring impulsivity in daily life: The momentary impulsivity scale.* Psychological Assessment. Advance online publication. doi: 10.1037/a0035083

Weinstein, S. M., & Mermelstein, R. J. (2013). *Influences of mood variability, negative moods, and depression on adolescent cigarette smoking.* Psychology Of Addictive Behaviors, doi:10.1037/a0031488

International Society for Research on Impulsivity. What is impulsivity? Retrieved from http://www.impulsivity.org/

Whiteside, S. P., & Lynam, D. R. (2001). *The Five Factor Model and impulsivity: Using a structural model of personality to understand impulsivity.* Personality And Individual Differences, 30(4), 669-689. doi:10.1016/S0191-8869(00)00064-7

Whiteside, S. P., Lynam, D. R., Miller, J. D., & Reynolds, S. K. (2005). *Validation of the UPPS impulsive behaviour scale: a four-factor model of impulsivity*. European Journal Of Personality, *19*(7), 559-574. doi:10.1002/per.556

Whiteside, S. P., & Lynam, D. R. (2009). *Understanding the role of impulsivity and externalizing psychopathology in alcohol abuse: Application of the UPPS Impulsive Behavior Scale*. Personality Disorders: Theory, Research, And Treatment, *S*(1), 69-79. doi:10.1037/1949-2715.S.1.69

Wilhelm, K., Mitchell, P., Slade, T., Brownhill, S., & Andrews, G. (2003). *Prevalence and correlates of DSM-IV major depression in an Australian national survey*. Journal Of Affective Disorders, *75*(2), 155-162. doi:10.1016/S0165-0327(02)00040-X)

Zvolensky, M. J., Jenkins, E. F., Johnson, K. A., & Goodwin, R. D. (2011). *Personality disorders and cigarette smoking among adults in the United States*. Journal Of Psychiatric Research, *45*(6), 835-841. doi:10.1016/j.jpsychires.2010.11.009